

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

REC'D 02 AUG 2005

WIPO **PCT** PCT

To:

see form PCT/ISA/220

6/10

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2005/001094

International filing date (day/month/year)  
23.03.2005

Priority date (day/month/year)  
26.03.2004

International Patent Classification (IPC) or both national classification and IPC  
H02K7/18

Applicant  
UNIVERSITY OF SOUTHAMPTON

### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b/s(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

von Rauch, E

Telephone No. +49 89 2399-2291



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2005/001094

**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2005/001094

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial  
applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 41

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the whole application or for said claims Nos. 41

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2005/001094

**Box No. IV Lack of unity of invention**

1. ☐ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:

- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ not paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

☒ complied with

☐ not complied with for the following reasons:

4. Consequently, this report has been established in respect of the following parts of the international application:

☐ all parts.

☒ the parts relating to claims Nos. 1

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	5,6,9,12-16,18,19,24-28,31-40
	No: Claims	1-4,7,8,10,11,17, 20-23,29,30
Inventive step (IS)	Yes: Claims	12,15-16,19,31
	No: Claims	1-11,13,14,17,18,20-30,32-39
Industrial applicability (IA)	Yes: Claims	1-40
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

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International application No.  
PCT/GB2005/001094

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**Box No. VI    Certain documents cited**

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1. Certain published documents (Rules 43*bis*.1 and 70.10)  
and /or
2. Non-written disclosures (Rules 43*bis*.1 and 70.9)  
see form 210

**Re Item IV.**

The separate groups of inventions are:

Claims 1-16:

generator comprising two magnets on a first mount and a coil on a second mount; coil and magnets are vibratable about their respective central position

Claims 17-31:

generator comprising two coils being located between a respective pair of magnets; each coil has a resonant frequency being different from the other

Claims 32-40:

use of a generator for signal transfer with a remote central unit

Claim 41:

all features shown in the drawings and not defined in claims 1-40

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

The International Searching Authority considers that there are IV inventions covered by the claims indicated as follows:

I : Claims 1-16 directed to a generator comprising two magnets on a first mount and a coil on a second mount, whereby both, magnets and coil, are vibratable about their central position

II: Claims 17-31 directed to generator comprising two coils located between a respective pair of magnets whereby each coil have a different resonant frequency

III: Claims 32-40 directed to the use of a microgenerator for signal transfer with a remote central unit

IV: Claim 41 directed to all features shown in the drawings and not defined in claims 1-40

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

**PCT/GB2005/001094**

The I.S.A. has carried out a partial search which relates to the inventions I-III mentioned above.

The reasons for which the present application has been deemed to contain N inventions which are not linked such that they form a single general inventive concept, as required by Rules 13.1, 13.2 and 13.3, PCT are as follows:

The prior art has been identified as: D1 (DE 43 38 103 A)

**Invention I:**

From a comparison of the disclosure of this prior art D1 and the technical features of claims 1-4, the features which are known from D1 are the following:

An electromagnetic generator comprising surrounding magnetic poles, creating a parallel field to a coil disposed inbetween; a relative movement between coil and magnet generates an electrical current in the coil; a vibratable first mount holds the magnet, a vibratable second mount holds the coil, whereby each of the magnet and coil is vibratable about a respective central position in anti-phase, when being excited by common vibration energy input;

from which analysis follows that the following technical features of claims 1-4 can be seen to make a contribution over this prior art (Special Technical Features (STF), (Rule 13.2 PCT)): First and second mount comprising a cantilever beam.

From these STF the objective problem to be solved by the 1st invention can be construed as: How to attach the vibratable mounts to a housing structure

**Invention II:**

From a comparison of the disclosure of this prior art and the technical features of claim 17 the following features can be seen to make a contribution over this prior art (Special

Technical Features (STF), (Rule 13.2 PCT)):

A second coil between its respective pair of magnets, wherein the first coils and the second coil each having different respective resonant frequencies when vibrated relative to their respective pair of magnets.

From these, the objective problem to be solved can be construed as: How to cover a larger frequency interval for a vibration-driven resonator.

Invention III:

From a comparison of the disclosure of this prior art and the technical features of claim 32 the following features can be seen to make a contribution over this prior art (Special Technical Features (STF), (Rule 13.2 PCT)):

A health and usage monitoring system for an aircraft comprising either the generator from claim 1 or the generator from claim 17.

From these, the objective problem to be solved can be construed as: How to incorporate a generator for signal transfer with a remote central unit.

The above analysis shows that the special technical features of invention I (claims 1-16) are neither the same as nor corresponding to those of invention II (claims 17-31), nor the same as or corresponding to those of invention III (claims 32-40).

This appears to show lack of corresponding technical effect as well. Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the (special) technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.



In conclusion, therefore, the four groups of claims are not linked by common or corresponding special technical features and define four different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of Unity of Invention as defined in Rules 13.1 & 13.2 PCT.

The Applicant should be aware that for above mentioned groups of inventions I,II, III, IV a full search has been carried out, without additional searching effort; this does not however imply that each of said groups of inventions, fulfil the requirement of unity of invention stipulated in Rule 13.1 PCT.

The search has been carried out also for claims 17-40 as negligible additional effort was involved.

No search could be carried out for claim 41.

**Re Item V.**

Claim 1 is not new over the the cited document D1, which discloses as well an electromagnetic generator comprising two magnets and a coil disposed therebetween, a vibratable first mount for each magnet, a vibratable second mount for the coil, whereby each of the at least two magnets and the coil are respectively vibratable about a respective central position.

# PATENT COOPERATION TREATY

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INTERNATIONAL SEARCHING AUTHORITY

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## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2005/001094

International filing date (day/month/year)  
23.03.2005

Priority date (day/month/year)  
26.03.2004

International Patent Classification (IPC) or both national classification and IPC  
H02K7/18

Applicant  
UNIVERSITY OF SOUTHAMPTON

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b/s(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

von Rauch, E

Telephone No. +49 89 2399-2291



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2005/001094

**Box No. 1 Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2005/001094

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial  
applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 41

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the whole application or for said claims Nos. 41

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form ☐ has not been furnished

☐ does not comply with the standard

the computer readable form ☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See separate sheet for further details

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2005/001094

**Box No. IV Lack of unity of invention**

1. ☐ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ not paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☒ complied with
  - ☐ not complied with for the following reasons:
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
  - ☒ the parts relating to claims Nos. 1

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	5,6,9,12-16,18,19,24-28,31-40
	No: Claims	1-4,7,8,10,11,17, 20-23,29,30
Inventive step (IS)	Yes: Claims	12,15-16,19,31
	No: Claims	1-11,13,14,17,18,20-30,32-39
Industrial applicability (IA)	Yes: Claims	1-40
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY.**

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International application No.  
PCT/GB2005/001094

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**Box No. VI    Certain documents cited**

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1. Certain published documents (Rules 43*bis*.1 and 70.10)  
and /or
2. Non-written disclosures (Rules 43*bis*.1 and 70.9)  
see form 210

**Re Item IV.**

The separate groups of inventions are:

Claims 1-16:

generator comprising two magnets on a first mount and a coil on a second mount; coil and magnets are vibratable about their respective central position

Claims 17-31:

generator comprising two coils being located between a respective pair of magnets; each coil has a resonant frequency being different from the other

Claims 32-40:

use of a generator for signal transfer with a remote central unit

Claim 41:

all features shown in the drawings and not defined in claims 1-40

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

The International Searching Authority considers that there are IV inventions covered by the claims indicated as follows:

I : Claims 1-16 directed to a generator comprising two magnets on a first mount and a coil on a second mount, whereby both, magnets and coil, are vibratable about their central position

II: Claims 17-31 directed to generator comprising two coils located between a respective pair of magnets whereby each coil have a different resonant frequency

III: Claims 32-40 directed to the use of a microgenerator for signal transfer with a remote central unit

IV: Claim 41 directed to all features shown in the drawings and not defined in claims 1-40

The I.S.A. has carried out a partial search which relates to the inventions I-III mentioned above.

The reasons for which the present application has been deemed to contain N inventions which are not linked such that they form a single general inventive concept, as required by Rules 13.1, 13.2 and 13.3, PCT are as follows:

The prior art has been identified as: D1 (DE 43 38 103 A)

**Invention I:**

From a comparison of the disclosure of this prior art D1 and the technical features of claims 1-4, the features which are known from D1 are the following:

An electromagnetic generator comprising surrounding magnetic poles, creating a parallel field to a coil disposed inbetween; a relative movement between coil and magnet generates an electrical current in the coil; a vibratable first mount holds the magnet, a vibratable second mount holds the coil, whereby each of the magnet and coil is vibratable about a respective central position in anti-phase, when being excited by common vibration energy input;

from which analysis follows that the following technical features of claims 1-4 can be seen to make a contribution over this prior art (Special Technical Features (STF), (Rule 13.2 PCT)): First and second mount comprising a cantilever beam.

From these STF the objective problem to be solved by the 1st invention can be construed as: How to attach the vibratable mounts to a housing structure

**Invention II:**

From a comparison of the disclosure of this prior art and the technical features of claim 17 the following features can be seen to make a contribution over this prior art (Special



Technical Features (STF), (Rule 13.2 PCT)):

A second coil between its respective pair of magnets, wherein the first coils and the second coil each having different respective resonant frequencies when vibrated relative to their respective pair of magnets.

From these, the objective problem to be solved can be construed as: How to cover a larger frequency interval for a vibration-driven resonator.

Invention III:

From a comparison of the disclosure of this prior art and the technical features of claim 32 the following features can be seen to make a contribution over this prior art (Special Technical Features (STF), (Rule 13.2 PCT)):

A health and usage monitoring system for an aircraft comprising either the generator from claim 1 or the generator from claim 17.

From these, the objective problem to be solved can be construed as: How to incorporate a generator for signal transfer with a remote central unit.

The above analysis shows that the special technical features of invention I (claims 1-16) are neither the same as nor corresponding to those of invention II (claims 17-31), nor the same as or corresponding to those of invention III (claims 32-40).

This appears to show lack of corresponding technical effect as well. Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the (special) technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

In conclusion, therefore, the four groups of claims are not linked by common or corresponding special technical features and define four different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of Unity of Invention as defined in Rules 13.1 & 13.2 PCT.

The Applicant should be aware that for above mentioned groups of inventions I, II, III, IV a full search has been carried out, without additional searching effort; this does not however imply that each of said groups of inventions, fulfil the requirement of unity of invention stipulated in Rule 13.1 PCT.

The search has been carried out also for claims 17-40 as negligible additional effort was involved.

No search could be carried out for claim 41.

**Re Item V.**

Claim 1 is not new over the the cited document D1, which discloses as well an electromagnetic generator comprising two magnets and a coil disposed therebetween, a vibratable first mount for each magnet, a vibratable second mount for the coil, whereby each of the at least two magnets and the coil are respectively vibratable about a respective central position.